

Amendment

In response to the Office Action dated April 10, 2002, please amend the above-identified application as follows:

IN THE TITLE:

Please amend the title to read as follows: –IMAGE FORMING APPARATUS COMPRISING MEANS FOR DETECTING AN AMOUNT OF DEVELOPER CONTAINED IN A DEVELOPER CONTAINER, A MEMORY FOR STORING THE AMOUNT DETECTED BY THE DETECTING MEANS, AND CONTROL MEANS FOR UPDATING THE INFORMATION STORED IN THE MEMORY–.

IN THE SPECIFICATION:

Applicants submit the attached clean and marked-up copies of a Substitute Specification to incorporate the amendments thereto. No new matter has been added.

IN THE CLAIMS:

Please cancel Claims 3 and 4 without prejudice to or disclaimer of the subject matter recited therein.

Please amend Claims 1, 2, and 13 as follows. A marked up copy of Claims 1, 2, and 13, showing the changes made thereto, is attached. Note that all the claims currently pending in this application, including those not presently being amended, have been reproduced below for the Examiner's convenience.

1. (Twice Amended) An image forming apparatus comprising:
an opening and closing member being openable and closable;
an exchanging member detachably attachable to a body of said image forming apparatus
and including a developer container for containing developer;

developer amount detecting means for detecting an amount of the developer contained
said developer container;

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a memory for storing information concerning the amount of the developer detected by
said detecting means;

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control means for causing said detecting means to perform a detection operation for the
developer a plurality of times, performing a confirmation process for confirming a result of said
detection operation to confirm a detection result, and updating the information stored in said
memory after confirming the detection result; and ; and

output means for outputting the information stored in said memory and concerning the
amount of the developer immediately after power from a power source of said apparatus is
inputted, immediately after said exchangeable member is loaded, or during a period from a time
immediately after said opening and closing member is closed to a time when said detection result
is confirmed by the confirmation process, and outputting the updated information after the
detection result is confirmed.

2. (Twice Amended) An image forming apparatus according to claim 1, further
comprising an agitating member for agitating the developer, and wherein said confirmation
process is performed using the amount of developer obtained by causing said agitating member

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to perform a rotation operation a plurality of times, and causing said developer amount detecting means to perform a detection operation at a timing in accordance with said rotation operation of said agitating member.

5. (Unamended) An image forming apparatus according to claim 1 further comprising a display, wherein the information outputted from said output means is indicated on said display.

6. (Unamended) An image forming apparatus according to claim 1, wherein said apparatus can communicate with an electronic apparatus having a display, and said output means outputs the information to the electronic apparatus.

7. (Unamended) An image forming apparatus according to claim 1 further comprising a video controller for developing image data transmitted from an external apparatus and producing an image signal, wherein said output means is provided in said video controller.

8. (Unamended) An image forming apparatus according to claim 7 further comprising comparing means for comparing remaining developer amount information stored in said memory with remaining developer amount information to be detected by said detecting means, wherein said comparing means is provided in said video controller.

9. (Unamended) An image forming apparatus according to claim 1, wherein the information concerning a remaining developer amount is remaining amount information.

10. (Unamended) An image forming apparatus according to claim 1, wherein the information concerning developer amount is information indicating that a remaining developer amount is less than a predetermined amount.

11. (Unamended) An image forming apparatus according to claim 1, wherein the information concerning the developer amount is information indicating that no developer remains.

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12. (Unamended) An image forming apparatus according to claim 1, wherein the information concerning the developer amount is information indicating that a remained developer amount is less than a predetermined amount and information indicating that no developer remains.

13. (Twice Amended) An image forming apparatus comprising:

a developer container for containing developer;

developer amount detecting means for detecting an amount of the developer contained in said developer container;

a memory for storing information concerning a remaining developer amount detected by said detecting means;

control means for updating the remaining developer amount information stored in said memory in accordance with a detection result of a detection operation of said detecting means; and

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output means for outputting remaining developer amount information stored in said memory,

wherein said output means outputs the information indicating the lesser amount of the remaining developer amount information stored in said memory and the remaining developer amount information obtained from the detection result of said detecting means, and

wherein said control means does not update the remaining developer amount information stored in said memory when the amount indicated by the remaining developer amount information obtained from the detection result of said detecting means is larger than the amount indicated by the remaining developer amount information stored in said memory.

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14. (Unamended) An image forming apparatus according to claim 13, wherein said output means outputs the remaining amount information stored in said memory until a detection result of said detecting means is confirmed.

15. (Unamended) An image forming apparatus according to claim 13, said output means outputs the remaining amount information stored in said memory immediately after power from a power source of said apparatus is inputted thereinto.

16. (Unamended) An image forming apparatus according to claim 13, wherein at least said developer container is detachably attachable to said apparatus, and said output means outputs the remaining amount information stored in said memory immediately after said developer container is inserted in said apparatus.

18. (Unamended) An image forming apparatus according to claim 13 further comprising a display, wherein the remaining amount information outputted from said output means is indicated on said display.

19. (Unamended) An image forming apparatus according to claim 13, wherein said apparatus can communicate with an electronic apparatus having a display, and said output means outputs the remaining amount information to the electronic apparatus.

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20. (Unamended) An image forming apparatus according to claim 13 further comprising a video controller for developing image data transmitted from an external apparatus and producing an image signal, wherein said output means is provided in said video controller.

21. (Unamended) An image forming apparatus according to claim 20 further comprising comparing means for comparing the remaining developer amount information stored in said memory with the remaining developer amount information to be detected by said detecting means, wherein said comparing means is provided in said video controller.

22. (Unamended) A cartridge detachably mountable on an image forming apparatus comprising:

developer container; and

a memory for memorizing a remained developer amount in said developer container, wherein the remained amount information memorized in said memory is serially updated.

23. (Unamended) A cartridge according to claim 22 further comprising developer amount detecting means for detecting an amount of the developer contained in said developer container.

24. (Unamended) A cartridge according to claim 22 further comprising a writing means for writing information into said memory.

25. (Unamended) A cartridge according to claim 22, wherein said apparatus is further provided with comparing means for comparing a remained developer amount information memorized in said memory with remained developer amount information to be detected by a detecting means.

26. (Unamended) A cartridge according to claim 22, wherein said memory further memorizes an information indicating that a remained developer amount is less than a predetermined amount.

27. (Unamended) A cartridge according to claim 22, wherein said memory further memorizes an information indicating that no developer remains.

28. (Unamended) A cartridge according to claim 22, wherein said memory further memorizes an information indicating that a remained developer amount is less than a predetermined amount and an information indicating that no developer remains.

29. (Unamended) A cartridge according to claim 22 further comprising at least one of an electrophotosensitive member, charging means for charging said electrophotosensitive member, a developing means for supplying the developer to said electrophotosensitive member and cleaning means for cleaning said electrophotosensitive member.

30. (Unamended) An image forming apparatus comprising:
a developer container for containing developer;
developer amount detecting means for detecting an amount of the developer contained in said developer container;
a memory for memorizing a remained developer amount detected by said detecting means, remained amount information memorized in said memory being serially updated; and
comparing means for comparing the remained developer amount information memorized in said memory with a remained developer amount information to be detected by said detecting means.

31. (Unamended) An image forming apparatus according to claim 30, wherein said comparing means compares the remained developer amount information memorized in said memory with the remained developer amount information to be detected by said detecting means and, when the difference between the information is equal to or larger than a predetermined amount, determines that said apparatus is abnormal.

32. (Unamended) An image forming apparatus according to claim 31 further comprising a display, wherein said display shows an indication showing abnormality when said apparatus is abnormal.

33. (Unamended) An image forming apparatus according to claim 31 further comprising output means for outputting an information concerning the comparison results of said comparing means to an electronic apparatus having a display that can communicate with said apparatus.

34. (Unamended) An image forming apparatus according to claim 31, wherein said memory further memorizes abnormality information.

35. (Unamended) An image forming apparatus according to claim 31, wherein the remained developer amount information memorized in said memory is not updated when the difference between the remained developer amount information memorized in said memory and the remained developer amount information to be detected by said detecting means is equal to or larger than a predetermined value.

36. (Unamended) An image forming apparatus according to claim 35, wherein the remained developer amount information memorized in said memory is not updated when the difference between the remained developer amount information memorized in said memory and the remained developer amount information to be detected by said detecting means is smaller than the predetermined value and the remained developer amount information to be detected by

said detecting means is larger than the remained developer amount information memorized in said memory.

37. (Unamended) An image forming apparatus according to claim 36, wherein the remained developer amount information memorized in said memory is indicated when the difference between the remained developer amount information memorized in said memory and the remained developer amount information to be detected by said detecting means is smaller than the predetermined value and the remained developer amount information to be detected by said detecting means is larger than the remained developer amount information memorized in said memory.

38. (Unamended) An image forming apparatus comprising:
a developer container for containing developer;
developer amount detecting means for detecting an amount of the developer contained in said developer container;

a memory for memorizing an information concerning the developer amount detected by said detecting means, said memory memorizing first information indicating that a remained developer amount is less than a predetermined amount and second information indicating that no developer remains; and

output means for outputting information indicating abnormality of the apparatus in case that said detecting means detects the second information when the first information is not memorized in said memory.

39. (Unamended) A cartridge detachably mountable on an image forming apparatus comprising:

a developer container; and

a memory for memorizing first information indicating that a remained developer amount in said developer container is less than a predetermined amount and second information indicating that no developer remains.

40. (Unamended) A cartridge according to claim 39, wherein said memory further memorizes an information indicating that abnormality has occurred in said apparatus or said cartridge.

41. (Unamended) A cartridge according to claim 40 further comprising developer amount detecting means for detecting an amount of the developer contained in said developer container.

42. (Unamended) A cartridge according to claim 40 further comprising a writing means for writing information into said memory.

43. (Unamended) A cartridge according to claim 40, wherein said apparatus is further provided with comparing means for comparing a remained developer amount information memorized in said memory with the remained developer amount information to be detected by detecting means.

44. (Unamended) A cartridge according to claim 40 further comprising at least one of an electrophotosensitive member, charging means for charging said electrophotosensitive member, a developing means for supplying the developer to said electrophotosensitive member, cleaning means for cleaning said electrophotosensitive member.

45. (Unamended) An image forming apparatus comprising:
a developer container for containing developer; and
developer amount detecting means for detecting an amount of the developer contained in said developer container,
wherein said detecting means can detect an amount of the developer by a first detecting method and a second detecting method having a detection time shorter than that of the first detecting method.

46. (Unamended) An image forming apparatus according to claim 45, wherein said detecting means calculates developer amount by the second detecting method immediately after the power source of said apparatus is inputted and while an amount of the developer is detected by the first detecting method.

47. (Unamended) An image forming apparatus according to claim 45, wherein at least said developer container is detachably attachable to said apparatus, and said detecting means calculates developer amount by the second detecting method immediately after said developer container is inserted in said apparatus and while an amount of the developer is detected by the first detecting method.

48. (Unamended) An image forming apparatus according to claim 45, wherein said detecting means calculates developer amount by the second detecting method immediately after a door of an apparatus main body is closed and while an amount of the developer is detected by the first detecting method.

49. (Unamended) An image forming apparatus according to claim 45 further comprising a memory for memorizing the amount of the developer detected by the first detecting means, wherein the developer amount information to be memorized in said memory is serially updated.

50. (Unamended) An image forming apparatus according to claim 49 further comprising abnormality detecting means for detecting abnormality by comparing the amount of the developer memorized in said memory with the amount of the developer to be detected by the second detecting method.

51. (Unamended) An image forming apparatus according to claim 50, wherein said abnormality detecting means determines that said apparatus is abnormal when the difference between the amount of developer memorized in said memory and the amount of the developer to be detected by the second detecting method is larger than a predetermined amount.

52. (Unamended) An image forming apparatus according to claim 51 further comprising a display, wherein said display shows an indication showing abnormality when said apparatus is abnormal.